These pages can be removed for copying and distribution to boaters.

Gas and Oil

One quart of oil will create an oil slick over two acres in size – the equivalent of nearly three football fields. A single gallon of fuel can contaminate over a million gallons of water. Small drips and spills of gasoline, diesel, and other petroleum products add up and can have a serious effect on the marine environment, such as: death of fish, mammals, and birds; cancer, mutations, and/or birth defects; destruction of plant life; and reduction of food supply for marine organisms.

Fuel Cautiously

- Fuel your boat slowly and carefully – attend the fuel nozzle at all times.
- Never "top off" or overfill your fuel tank. Only fill the tank to 90% since fuel expands as it warms up.
- Use your hand to check for air escaping from the vent. When the tank is nearly full, you'll feel an increase in airflow. Also listen for a gurgling sound before the tank is full.
- Use fuel bib or collar to catch drips and backsplash from fuel intake and vent overflow.
- Fill portable gas tanks on shore – where spills are less likely to occur and easier to clean up.
- Outboards: close tank fuel vent when boat is not in use to save fuel from vapor loss.
- Built-in fuel tanks: install fuel/air separator in air vent line from tank to prevent vent spills.

Fuel Bib
(courtesy of BoatUS)

Traditional two-stroke engines are inefficient and can release up to 30 percent of their gas/oil mixture unburned directly into the water. Direct injected new technology two-stroke engines consume all of their oil, resulting in no oil sheen or smoke and no dirty waste oil to change. All four-stroke and traditional two-stroke engines may emit carbon monoxide at levels 100 times higher than new technology two-stroke engines and than safe workplace standards. If these high carbon monoxide emissions are trapped, passengers may be exposed to dangerous levels.

Reduce engine pollution

- Consider replacing a conventional two-stroke outboard with a quieter, cleaner, and more efficient new technology two-stroke or a four-stroke engine.
- Use premium two-cycle engine oil and use the gas to oil ratio recommended by the engine manufacturer.
- If you have a large outboard you don't plan to replace, consider purchasing a small four-stroke "kicker" to use when trolling or moving short distances. You'll save money on fuel, save wear-and-tear on your larger motor and enjoy a cleaner environment, too.

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Properly Dispose of Oil Absorbent Materials

- Reuse pads that are contaminated with gasoline.
- If pad is contaminated with only diesel or oil, wring out over oil recycling bins and reuse. Or, place in one plastic bag sealed in another and discard in your regular trash.
- Bio-remediation bilge booms may be discarded in your regular trash as long as they are not dripping. Because the microbes need oxygen to function, do not seal them in plastic bags.
- Remember that materials soaked with fuel, oil, or solvents are flammable – keep away from heat.

Bilges

Bilges are also a major source of pollution since they tend to collect engine oil, fuel, antifreeze, and transmission fluid. When an automatic bilge pump is activated, these fluids are pumped overboard. Absorbent bilge pads absorb petroleum products but not water. When soaked with oil, they can be disposed of properly.

Control Oil in the Bilge

- Place oil absorbent pads or a bio-remediation bilge boom in the bilge to catch oil.
- Place an oil absorbent pad under the engine.
- Replace oil absorbent materials when heavily soiled or saturated, or at least once a year.
- Keep the engine well tuned: no leaking seals, gaskets, or hoses.
- Change oil filters often. Slip a plastic bag over filter before removal to catch drips.
- Never discharge or pump any bilge water that appears oily into or near the water – it is against the law.

Bilge Socks
(courtesy of BoatUS)

- Install a bilge pump switch that leaves an inch or two of water in the bilge. Or, connect a bilge water filter to your vessel's bilge pump. Filters will remove oil and fuel from the water.
- Trailer your boat to an area that provides containment before removing bilge or boat plugs.
- Do not use bilge cleaners when pumping to a waterbody - they simply spread out the oil and do not remove it from the bilge water.

When dispersants, such as detergents, soaps, and solvents, are put on fuel spills, fuel that might otherwise evaporate from the surface is dispersed down into the water. This rainfall effect causes contamination of all levels of the water, rather than just the surface, and is very difficult to cleanup. Left alone the gasoline will evaporate and, while smelly, by comparison is less harmful. Along with causing this dispersion effect, the detergent harms marine life.

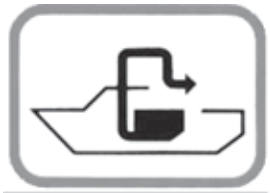
Handle spills appropriately

- If you have a spill, wipe it up with a rag – don't hose it off into the water.
- If fuel is spilled into the water:
  - Don't use soap or dish detergent to disperse it. Using detergents to disperse fuel worsens the problem and is against federal law.
  - Call 1-800-OILS-911 for both large and small spills.
- If a spill occurs in a marina, notify the marina management immediately.

Sewage Disposal

When sewage is pumped or dumped directly into the water, there is a potential for disease-carrying microorganisms to be released into that water. These microorganisms can cause human diseases such as gastroenteritis, hepatitis, typhoid, cholera, and dysentery. In addition, as bacteria and other microorganisms decay the sewage, they use up oxygen that fish and other marine life need to breathe. Discharge of vessel sewage is especially harmful due to its high concentration of sewage and the presence of chemical additives – such as formaldehyde, para-formaldehyde, quaternary ammonium chloride and zinc sulphate – which are toxic to marine life.

Don't Dump Overboard!



Look for the Pumpout Sign

- Know your marine sanitation device (MSD) type and manage it appropriately.
- Type III MSDs are the most common MSDs on recreational vessels and include recirculating and incinerating MSDs and holding tanks. It is illegal to discharge sewage from a Type III MSD overboard into coastal waters, lakes, or reservoirs. Use pumpout facilities for Type III MSDs.
- Type I and II MSDs treat the sewage and must not be discharged while in moorage or on lakes or reservoirs.
- Empty portable toilets at dump stations or at home. Discharge of this untreated sewage overboard to coastal waters or into a lake or reservoir is illegal.
- If boat has a holding tank with a y-valve and through-hull fitting, keep them locked closed when inside coastal waters or on lakes or reservoirs.
- See "A Guide to Marine Sewage Disposal Stations in Coastal South Carolina, available from OCRM for pumpout and dump station locations.

Handle Sewage Appropriately

- Use restrooms on shore whenever possible.
- Establish a regular maintenance schedule for your MSD based on manufacturer's recommendations.
- Avoid using additives like quaternary ammonium compounds (QAC) or formaldehyde in your holding tank. Use safer enzyme-based products to control odor and reduce solids.
- Consider installing a filtered air holding tank.
- Keep diapers, sanitary napkins, oils, solvents, and other harmful chemicals out of toilets.
- If using pumpout equipment, wash your hands with antibacterial soap after use.
- Dispose of your pet's waste properly.

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Gray Water

- Water from sinks, washers, and showers are discharged directly into the water without treatment. This gray water is often rich in phosphates that pollute the water and encourage the growth of unwanted algae.
- Use upland laundry facilities and showers whenever possible.
- Limit the amount of water you use in sinks and showers.
- Use non-phosphate soaps.

Garbage

Trash – plastic bags, Styrofoam, bottles, cans, discarded nets, fishing line, and other refuse – can injure or kill aquatic life and birds by trapping or suffocating them. Along with being unsightly, trash can also foul props, clog water intake fittings, and damage fishing nets.

Contain Trash: Nothing overboard!

- Bring a container aboard to collect your garbage and keep it from blowing overboard.
- Minimize the use of plastic wrap and bags when packing for your trip.
- Don't toss any garbage or cigarettes overboard; cigarette filters are plastic and deadly to birds and fish.
- If trash blows overboard, retrieve it – consider it "crew-overboard" practice.
- Teach everyone on board that tossing anything into the water is just not done.
- Pick up other trash in the water or along the shore if you can reach it safely.
- Recycle cans, glass, plastic, and newspapers.
- Bring used monofilament fishing line to recycling bins at your marina or tackle shop.
- Encourage your marina to provide well-marked trashcans and recycling bins.

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Boat Cleaning

Many products used to clean boats contain toxic chemicals such as chlorine, phosphates, and ammonia. These products can enter the water during boat cleaning and can poison marine life. Degreasers dry the natural oils fish need for their gills to take in oxygen. The best way to keep toxic chemicals out of the water is to not use them at all. In many cases, "elbow grease" will go a long way.

Clean Gently

- When possible, wash the boat on land where the wash water can be contained or filtered.
- Wash your boat frequently with sponge and plain water.
- Use detergents sparingly.
- Avoid cleaners with bleach, ammonia, lye, or petroleum distillates.
- Use phosphate-free, biodegradable and non-toxic cleaners, such as those in table. Though much less harmful, these cleaners can still cause damage to local marine life and should be used only on land when possible.
- If your boat does not have sloughing paint on it, wash over grass or soil with an environmentally friendly detergent.
- Wax your boat – a good coat of wax prevents surface dirt from becoming ingrained.
- Clean wood with a mild soap powder and a nylon brush – not harsh chemical cleaners.
- Ask your ship's store to stock common alternative products listed in the table and biodegradable spray-type cleaners that do not require rinsing.

Toxic Water
(Courtesy of Surfrider)

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Non-toxic Cleaning Alternatives

Toxic Product	Alternative
All Purpose Cleaner	Mix one cup white vinegar with two gallons water.
Air Freshener	Leave out an open box of baking soda.
Aluminum Cleaner	2 Tablespoons cream of tartar in 1 quart hot water.
Ammonia-Based Cleaners	Vinegar, salt, and water.
Bleach	Borax or hydrogen peroxide
Brass Cleaner	Worcestershire sauce. Or paste made of equal parts of salt, vinegar, and water.
Chrome Cleaner/Polish	Apple cider vinegar to clean; baby oil to polish.
Copper Cleaner	Lemon juice and water. Or paste of lemon juice, salt, and flour.
Drain Opener	Disassemble and replace or use plumber's snake. Or flush with boiling water, plus ¼ cup baking soda, plus ¼ cup vinegar.
Fiberglass Stain Remover	Baking soda paste.
Floor Cleaner	One cup white vinegar in 2 gallons water
General Cleaner	Baking soda and vinegar. Or lemon juice combined with borax paste.
Hand Cleaner	Baby oil or margarine.
Head Cleaner	Put in baking soda and use a brush.
Mildew Remover	Paste using equal parts of lemon juice and salt or white vinegar and salt
Rug/Upholstery Cleaner	Sprinkle on dry cornstarch and then vacuum.
Scouring Powders	Baking soda or salt. Or rub area with one-half of a lemon dipped in borax, then rinse.
Shower Cleaner	Wet surface, sprinkle with baking soda, rub with scouring cloth.
Stainless Steel Cleaner	Baking soda or mineral oil for polishing, vinegar to remove spots.
Toilet Bowl Cleaner	Use toilet brush and baking soda.
Varnish Cleaner	Wipe with ½ cup vinegar and ½ cup water solution
Window Cleaner	Mix two tablespoons vinegar in one quart of water or rub glass with newspaper.
Wood Polish	3 parts olive oil and 1 part white vinegar (for interior unvarnished wood only).

Vessel Maintenance

General upkeep of boats generates household hazardous wastes such as solvent paint waste, used antifreeze, used oil, old gasoline, used batteries, mercury containing bilge pump switches, and out-of-date flares. These wastes pose a threat to the environment if they are improperly disposed into the water, air, or ground.

Manage your Hazardous Waste

- Use less-toxic propylene glycol antifreeze (usually pink).
- Use premium two-cycle engine oil.
- Share any leftover chemicals, paint, or varnish.
- Recycle used motor oil, antifreeze, and other engine fluids. Prior to recycling, store in separate closed containers to prevent escape, mixing, or fire hazard.
- Bring items to a local hazardous waste collection day or facility.
  Visit http://www.scdhec.gov/recycle for local recycling centers
- Encourage your marina to offer oil recycling.
- Trade in a used battery for a possible credit toward a replacement battery.
- If out-of-date flares have not been exposed to water and are undamaged, keep them on the boat along with the number of required in-date flares.
- When possible, use paints that are not solvent based.
- Buy bilge pump switches that do not contain mercury. Check with marina on mercury containing bilge switch disposal.

Recycle

Oil	Aluminum	Solvents
Antifreeze	Cardboard	Steel
Lead batteries	Metal fuel filter canisters	Scrap Metal
Glass	Mixed Paper	Tin
Plastic	Newspaper	Tires

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Hull Paint

Anti-foulant coatings on boat hulls are another toxic threat to marine life. These coatings contain compounds such as copper that kill marine organisms that grow on the underside of a boat. These coatings, especially ablative (a.k.a. soft, self-polishing, or sloughing) coatings, also release toxic compounds into the water. Hard antifouling coatings have extended antifouling properties, but limit the amount of toxic metals leached into the water. Hard coatings also release less material into the water when they are cleaned.

Maintain your Hull Wisely

- Consider alternatives to toxic sloughing bottom paints.
  - Some good alternatives are silicon, polyurethane, Teflon, and other hard antifouling coatings.
  - These alternatives rely on a slick surface to discourage the growth of marine organisms rather than killing them.
- If boat has a sloughing paint coat, do not clean the boat bottom while in the water – this creates a discharge of toxic paint chips in the water. Only clean running gear and anodes.
- Clean boat bottoms ashore over hard surfaces or a tarp, where all debris can be contained.
- Wait 90 days to clean a newly painted hull, as it will release more toxins when new.
- Consider storing your boat out of the water to prevent fouling.
- Do hull work inside or under cover where rain can't wash dirt, dust, oil, or solvents into the water.
- Use a dust-less or vacuum sander, or a drop cloth to collect all paint chips, dust, and residue. Dispose in regular trash.

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Fish Bait/Waste

In small quantities, crabs and other marine animals scavenge fish waste. However, in an enclosed marina basin decomposition of excessive fish waste can produce foul odors and impair water quality through increased nutrient and bacteria levels and decreased dissolved oxygen. This can cause fish kills as well as an unsightly mess.

Dispose of Fish Waste Properly

- Do not throw fish waste, unwanted bait, or bait packaging into marina waters.
- Discard fish waste over deep water or in the trash.
- If available, use fish cleaning stations.
- Recycle fish parts by composting with peat moss or burying in the garden as fertilizer. Or freeze fish waste and reuse as chum or bait.

Fish Cleaning Station

Underway

Boat traffic (including personal watercraft) through shallow-water areas and in the nearshore areas at wake-producing speeds can stir up bottom sediment, uproot submerged aquatic vegetation, erode shorelines, and harm some animals. Disturbed sediment can cause darker waters which harm aquatic plant life and bottom-dwelling organisms, reduce dissolved oxygen levels, and disrupt fish feeding. The loss of underwater plants reduces available habitat for fish, shellfish, and waterfowl, diminishes the recycling of nutrients, and decreases natural shoreline erosion protection.

(Courtesy of S.C. DNR)

Protect Sensitive Habitat

- Always be aware of your wake. Distribute your passengers equally. A heavy stern creates a larger wake.
- Observe posted No-Wake Zones.
- Operate away from shore as much as possible to avoid disturbing wildlife, chopping vegetation, and disturbing bottom sediments.
- Proceed slowly in shallow areas.
- Do not disturb wildlife.

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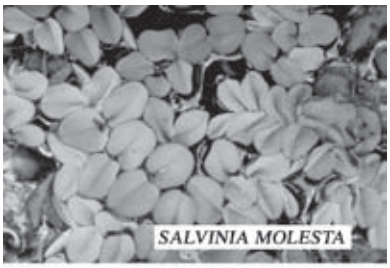
Aquatic Nuisance Species

Exotic plants and animals such as the zebra mussel, hydrilla, and salvinia can hitch a ride attached to your boat or trailer or as tiny young present in water taken in by your boat. Hitching from one waterbody to another, these aquatic nuisance species spread quickly and can become established in another waterbody. They contribute to the degradation of water quality and fish and wildlife habitat by displacing native species and by blocking light needed by submerged aquatic plants. Once introduced, control of aquatic nuisance species is very expensive and extermination is extremely difficult.

Stop the Spread of Aquatic Nuisance Species

- Never release live or dead bait or bait packaging into a waterbody, or release aquatic animals from one waterbody into another.
- Share live bait with other anglers or empty your bait bucket in the trash before leaving the area.
- Inspect your boat and trailer, especially at the points in the diagram. Remove any plants and animals you see before leaving the waterbody.
- Avoid chopping vegetation with outboard motor propellers.
- When hauling your boat, drain your motor, wet well, and bilge in a containment area on shore.
- Rinse your boat, trailer, and equipment. It is best to use high-pressure, hot water. A garden hose will work if no other option is available.
- Be especially careful if you've been boating in an infested lake, or if you're buying or using a boat that has come from out of state. Flush raw water-cooling systems and clean sea strainers.
- Air-dry your boat and equipment for as long as possible – at least five days is optimal.
- If you find one of the below species, or suspect there may be a new infestation, go to http://www.protectyourwaters.net/sc.

Hydrilla
(Photo courtesy of SC DNR)



Salvinia Molesta
(Photo courtesy of SC DNR)

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Contacts For More Information

Air Quality	S.C. DHEC	(803) 898-4123
Clean Marina Program	S.C. DHEC-OCRM	(843) 953-0200
Clean Vessel Act & Facility Grants	S.C. DHEC-OCRM	(843) 953-0200
Dredge, Fill, & Underwater Construction	S.C. DHEC-OCRM US Army Corps of Engineers	(843) 747-4323 (866) 329-8187
Fish and Wildlife & Endangered Species Act	South Carolina Dept of Natural Resources	http://www.dnr.sc.gov or 803-734-3886
Hazardous Waste	S.C. DHEC Hazardous Waste Compliance and Enforcement Division S.C. DHEC Hazardous Waste Website Spill Prevention, Control, and Countermeasure (SPCC) Plans Emergency Planning and Community Right-to-Know Act (EPCRA)	(803) 896-4136 http://www.scdhec.gov/lwm http://www.scdhec.gov/lwm/html/haz http://www.epa.gov/oilspill/spcc.htm http://www.epa.gov/ceppo/
Land Use Planning & Coastal Resource Management	S.C. DHEC Office of Ocean and Coastal Resource Management	http://www.scdhec.gov/environment/ocrm (843) 953-0200
Recreational Boating Info	South Carolina Department of Natural Resources	(803) 734-3857
Solid Waste (Trash and recycling)	EQC Office of Solid Waste Reduction and Recycling	http://www.scdhec.gov/lwm/html/solid.html (800) 768-7348
Spill Reporting	South Carolina Emergency Response System National Response Center	(888) 481-0125 (800) 424-8802
Stormwater Discharge Permits	S.C. Department of Health and Environmental Control OCRM Website EQC-Bureau of Water Website	http://www.scdhec.gov/environment/ocrm/permit/stormwater.htm http://www.scdhec.gov/eqc/water/

Total Maximum Daily Loads	Department of Health and Environmental Control	http://www.scdhec.gov/eqc/water/html/npdespage.html
Underground Storage Tanks	Department of Health and Environmental Control	(803) 896-6241 http://www.scdhec.gov/ust
Voluntary Programs & Cleanups	Dan Burger, SCDHEC-OCRM Director of Communications	(843) 747-4323 x. 135 or burgerdj@dhec.sc.gov

Glossary of Terms

Ballast Water - Water placed in the hold of a boat or ship to maintain stability.

Black Water - Water-carried human wastes, including feces, urine, and other extraneous substances of bodily origin (including toilet paper).

Boathouse - A covered floating structure primarily used for wet or dry storage of a boat.

Boat Waste Collection Device - All types of stationary, portable, or mobile equipment that collects and transfers black water from boats. Includes boat pumpout and dump stations.

Dump Station - A device that receives sewage from a portable toilet.

Dwelling - A structure, boat, or vessel that has sleeping, cooking, and plumbing fixtures used for human occupancy or are used for residential purposes.

Fugitive Emissions - Dust, fumes, gases, mist, odorous matter, vapors, or any combination thereof not easily given to measurement, collection, and treatment by conventional pollution control methods.

Gray Water - Any water carried waste other than black water, including kitchen and laundry waste.

Hydroblasting - Use of pressurized water to remove paint or oxidized metal.

Houseboat - A self-propelled boat designed for use as a temporary dwelling. Any houseboat moored in one location and used as a dwelling for more than ten of any 30-day period is classified as a "live-a-board."

Live-a-board - A boat moored in one location and used as a dwelling for more than ten of any 30-day period.

Marine Sanitation Device (MSD) - A U.S. Coast Guard approved type I, II, or III device used to treat or retain in a holding tank all boat toilet fixture waste generated from a boat or vessel.

Moored - Secured or tied-up to a dock, pile, float, buoy, or at anchor.

Operating - Underway; not moored.

Owners - Includes but not limited to individuals, corporations, entities, operators, renters, or other responsible person in control or having control of real or personal property.

Petroleum – SC Code 44-2-20(17)(b), the term "regulated substance" includes, but is not limited to petroleum and petroleum based substances comprised of a complex blend of hydrocarbons derived from crude oil through processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Plumbing Fixture - Includes but not limited to toilets, showers, lavatories, and laundry fixtures.

Pressure Washing - Use of a water pressure washer to remove dirt or biological growth from a vessel's hull. Pressure washing includes the practice of hand scrubbing and rinsing with low-pressure water from a hose. Pressure washing that removes paint is hydroblasting.

Portable Toilet - Includes all types of portable toilets and hand-carried potties used to collect black water.

Pumpout - A stationary or portable pumping or suction device that removes waste from a boat holding tank and transfers it to an approved municipal, septic, on-site sewage treatment system, or land side holding tank for disposal.

Sewage - Black water and/or gray water waste.

Solid Waste – means any garbage, refuse, or sludge from a waste treatment facility, water supply plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. This term does not include solid or dissolved material in domestic sewage, recovered materials, or solid or dissolved in irrigation returns flows or industrial discharges which are point sources subject to NPDES permits under the Federal Water Pollution Control Act, as amended, or the Pollution Control Act of South Carolina, as amended, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended. Also excluded from this definition are application of fertilizer and animal manure during normal agricultural operations or refuse as defined and regulated pursuant to the South Carolina Mining Act, included processed mineral waste, which will not have a significant adverse impact on the environment.

Stormwater - Stormwater runoff, snowmelt runoff, surface runoff, road wash water related to road cleaning or maintenance, infiltration (other than infiltration contaminated from sanitary sewers or other discharges) and drainage.

Structure - Includes but not limited to boathouses, combos, and floating homes used as dwellings.

Waters of the State - Includes lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic Ocean within the territorial limits of the State, and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt, which are wholly or partially within or bordering the State or within its jurisdiction (SC Code 48-1-10(2).

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Ocean and Coastal
Resource Management

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